Compact HOM Damping Scheme for 704 MHz LINACs

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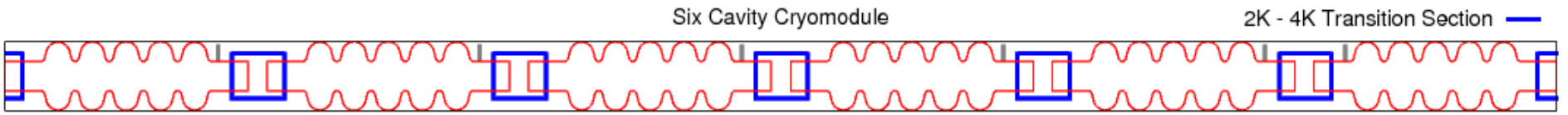
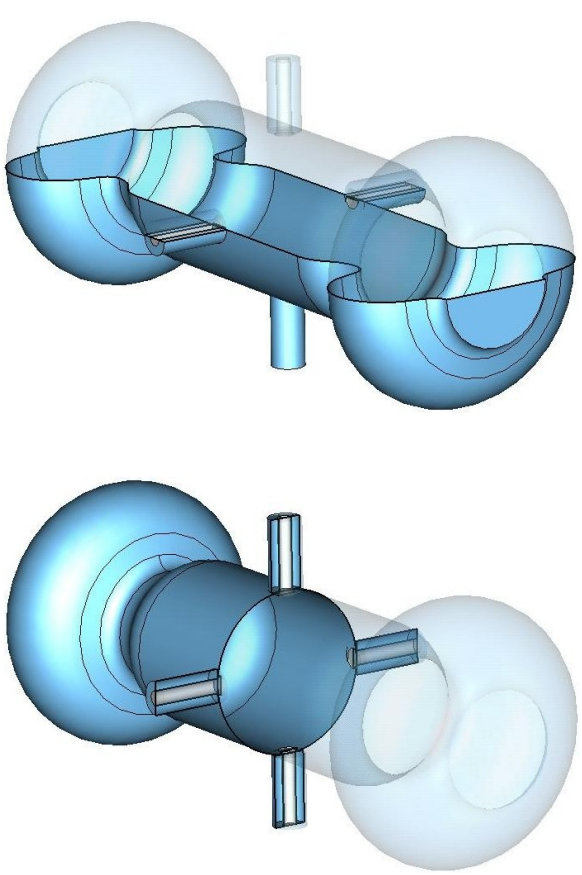


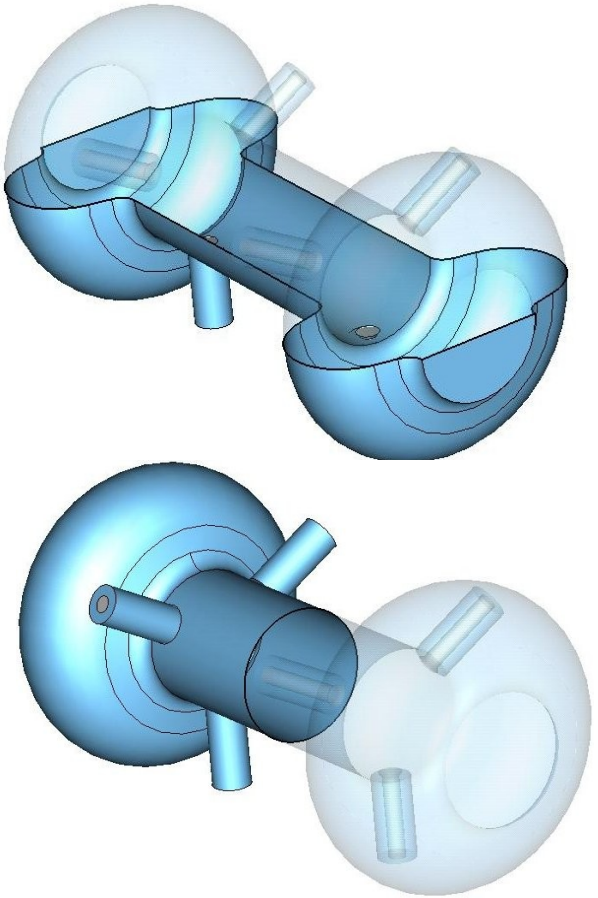
EIC Cryomodule will consist of:

- 6 x 5-cell cavities
- 6 fundamental power couplers
- 5 compact transition sections
- 2-half end-caps
- 6 tuner assemblies
- 6 helium vessels and cryogenic feed-throughs
- Super-insulation, thermal, magnetic shielding
- Support structures, access ports, instrumentation etc...

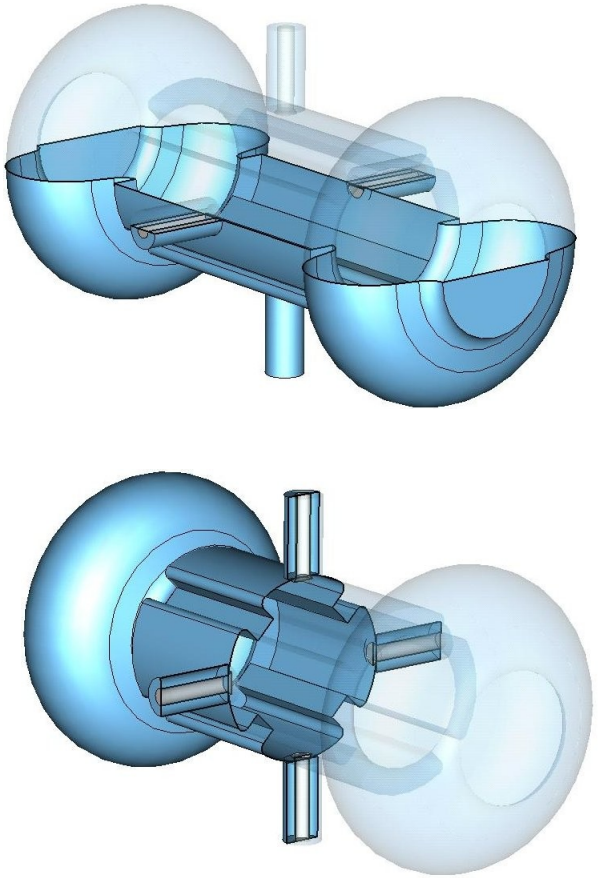
Towards a compact transition section



Enlarged beam pipe +
Couplers and/or ferrites



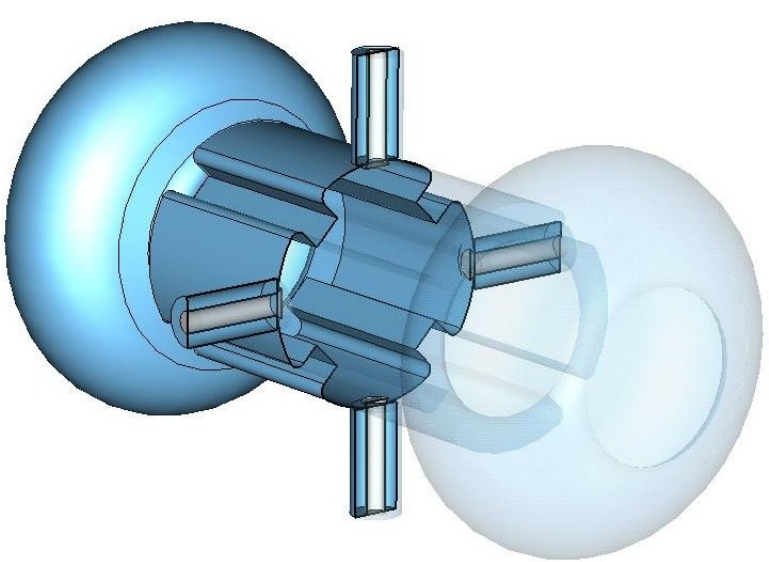
Conventional HOM couplers

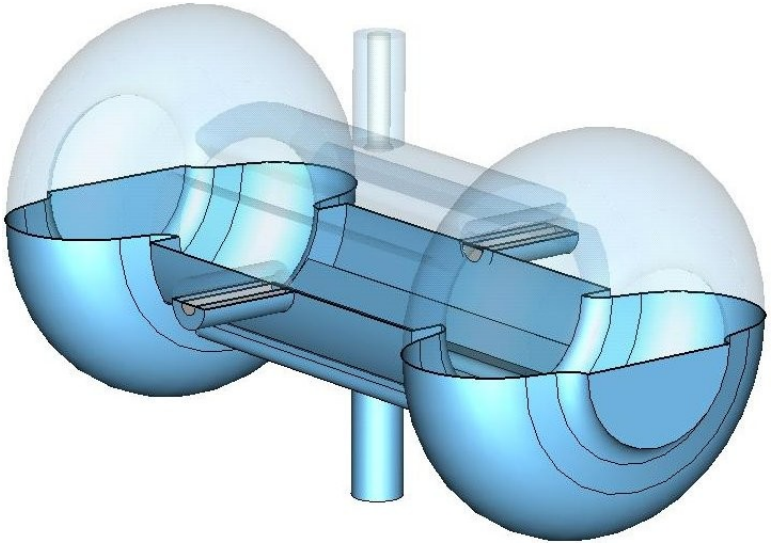


Ridged waveguide +
Couplers and/or ferrites

- Option 3 will need shorter than 2, which is the current ERL design
- No sensitive rejection-filter required, HOM power handling easier, FPC/tuner placement easier

Ridged waveguide





The transition section will specifically focus on a four-rigde structure with HOM loops:

1. 3D wakefield simulations to compare different types of transition sections with loops and/or ferrite absorbers.
2. Multipacting simulations of four-ridge type transmission line.
3. Fabrication of one or more transition section in Copper and Niobium to bench test the transmission line characteristics in the frequency range of interest.
4. Determine the complexity in manufacturing process and structural integrity in high vaccum conditions for the four-ridge type structure. Test use of cold-ferrites (~80K)

Post-Doc (design studies) + 100k for fabrication and testing